

REMARKS

Claims 1-38 are in the application.

The claims have been amended to more particularly point out and distinctly claim applicants' invention. The claims have been amended to make hyphenation consistent throughout the claims, and to correct a typographical error. No new matter is presented thereby, and the amendments are fully supported by the application as filed.

The Examiner has required, pursuant to 35 U.S.C. 121, applicants to elect between one of the following groups of inventions:

I. Claims 1-18, drawn to a process for producing algae resistant roofing granules, classified in class 427, subclass 212.

II. Claims 19-38, drawn to a process for producing algae resistant roofing shingles, classified in class 427, subclass 180.

The Examiner states that the inventions are distinct, each from the other because: inventions I and II are related as product and process of use. The Examiner notes that the inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). The Examiner states that in the instant case granules can be used for outdoor surfacing other than roofing.

The Examiner further states that because these inventions are distinct for the reasons given, and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

Applicants respectfully elect the invention of Group I, claims 1-18, for prosecution in the present application, with traverse.

In order for the subject matter of the Group I claims to be distinct from the subject matter of the Group II claims, the product as claimed by the Group I claims must be useful in a materially different process than that of the Group II claims. By this test, the two groups of claims are not distinct. The use proposed by the Examiner is not materially different than that of the Group II claims. The algae resistant granules are presumably being used in the use proposed by the Examiner, namely, for "outdoor surfacing other than roofing," for the exactly the same purpose as they are being used in the roofing shingles of the Group II claims. Further, the use proposed by the Examiner appears speculative and does not appear to be a "substantial" use, nor does it appear to be a "specific" use. A use proposed for the determination of distinctiveness in making a restriction requirement should be no less substantial and no less specific than that required under case law in determining patentability under 35 U.S.C. § 101. As the Court of Appeals for the Federal Circuit recently explained in the Fisher case, a proposed use must be both specific and substantial. In re Fisher, 76 USPQ2d 1225, 1230 (Fed. Cir. 2005). In the present case, the Examiner has suggested that the product roofing granules could be used for surfacing some other outdoor surface. The proposed use is on its face not a specific use. Furthermore, this proposed use is not substantial. To the undersigned attorney's knowledge, there does not appear to be any genuine, actual use of *roofing* granules for anything other than roofing. The Examiner's proposed alternative use could encompass simply dumping the granules on the ground – this is not a substantial use. Consequently, applicants respectfully request reconsideration and withdrawal of the restriction requirement.

Claims 16 and 17 stand objected to under 37 CFR 1.75 as being the substantial duplicate of claims 7 and 8. The objection is respectfully traversed and withdrawal of the objection is respectfully requested.

The Examiner states that when two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim, citing MPEP § 706.03(k).

Applicants respectfully note that the Examiner has not yet allowed any of claims 7, 8, 16 or 17. Thus, it is not proper to reject any of these claims on same invention-type double patenting grounds until one of these pairs of claims has been allowed. Furthermore, applicants respectfully traverse the Examiner's assertion that these claims differ only by "a slight difference in wording" as applied to the amended claims. Claim 16 had been amended to correct a typographical error so that it depends from claim 15 rather than claim 1. For these reasons, reconsideration and withdrawal of the objection are respectfully requested.

Claims 1, 5-8, 16-17 stand provisionally rejected under the judicially created doctrine of double patenting over claims 1-12, 21, 25 of copending Application No. 10/600,847. This provisional rejection is respectfully traversed and reconsideration and withdrawal of the provisional rejection.

The Examiner states that this is a provisional double patenting rejection since the conflicting claims have not yet been patented. The Examiner further states that the subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since claims of current application are broader than those of copending Application No. 10/600,847. The Examiner further states that there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending application, citing In re Schneller, 397 F.2d 350, 158 USPQ 210 (CCPA 1968), and MPEP § 804.

Applicants respectfully traverse the Examiner's contention that the subject matter of the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application. The respective applications claims are drawn to distinct inventions, as can be seen from simple inspection of their independent claims, and the disclosures of the two applications are not the same. Applicants also respectfully traverse the Examiner's contention that there is no reason why applicants would be prevented from presently claims corresponding to those of the instant application in the other copending application. There are such reasons, for example, because the disclosures of the two applications are of differing scope and content. The provisional double patenting rejection should be withdrawn for these reasons.

Claims 1, 5-8, 13, 14, 16 and 17 stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 6,214,466 ("Joedicke"). This rejection is respectfully traversed, and reconsideration and withdrawal of the rejection are respectfully requested as applicable to the amended claims.

The Examiner states Joedicke discloses a process for producing algae resistant roofing granules, the process comprising applying to base granules a first coating composition containing sodium silicate, a kaolin clay (aluminosilicate) and a combination of cuprous oxide and zinc sulfide, and kiln-firing the coated granules (referencing column 2, lines 45-65), cooling the fired coated granules and applying to the algaeicide bearing granules a second coating composition containing sodium silicate, a kaolin clay and a pigment (claimed colorant composition), and kiln-firing the colorant-coated algaeicide bearing granules 740-760 degrees F (393-404 degrees C) (referencing column 4, lines 25-31) to fuse the binder (referencing column 3, lines 8-14).

It should be noted that applicants' claim 1 requires a "providing porous, inert base particles" and that the other claims rejected over this reference depend proximately or ultimately, from claim 1.

However, Joedicke does not disclose, explicitly or inherently, porous base particles.

Consequently, Joedicke does not disclose each and every limitation of the presently claimed invention, and thus does not anticipate that invention.

Joedicke discloses algae-resistant roofing granules coated with a first coat consisting of a silicate-clay matrix containing cuprous oxide and zinc sulfide to provide a long-term release of copper and zinc ions and a second coat containing a pigment. Joedicke's granules are manufactured by a process which includes "crushing and sizing a base aggregate to the desired size, typically to No. 11 grading," and then heating and coating the "sized/graded" granules (col. 2, lines 42-51). Crushing and sizing the base mineral aggregates to the desired size are "essential steps" in Joedicke's manufacturing process (col. 4, lines 18-23). The mineral aggregates employed by Joedicke are "natural base rocks such as greenstone, rhyolite, andesite, basalt, nepheline syanite, and the like" (col. 4, lines 15-19).

Thus, Joedicke does not employ porous mineral aggregate. The disclosed mineral aggregates are not explicitly known to be porous, and there is nothing to suggest any are inherently porous. Further, Joedicke does not bind together mineral aggregate particles to form the base mineral aggregate. Instead, the raw aggregate is merely crushed and sized. Thus, Joedicke cannot possibly provide inherently porous base material formed from smaller particles.

Reconsideration and withdrawal of the rejection entered under 35 U.S.C. 102(b) over Joedicke as applicable to the amended claims are respectfully requested for this reason.

Nor does Joedicke render the presently claimed invention obvious. There is nothing to disclose or suggest applicants' presently claimed invention to one of ordinary skill in the art. Joedicke suggests only the use of conventional sized and graded crushed aggregate for use as base particles, and a different approach to the problem of extended release of algaecide from the granules.

Claims 1, 5-8, 16, and 17 stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 3,528,842 ("Skadulis"). This rejection is also respectfully traversed, and reconsideration and withdrawal of the rejection are respectfully requested as applicable to the amended claims.

The Examiner states that Skadulis discloses a process for producing algae resistant roofing granules, the process comprising applying a kaolin (aluminosilicate) containing coating (referencing column 4, line 17) to greystone or nepheline syenite granules of #11 grade in a tumbling barrel type mixer, pre-drying the granules and transferring them to a rotary firing pot and firing at 950 degrees F (510 degrees C) (referencing column 4, lines 25-31), then applying to the formed base particles an aqueous composition containing cuprous oxide followed by firing at 700 degrees F (371 degrees C) to insolubilize the silicate coating (referencing column 4, lines 32-49).

Skadulis does not employ porous mineral aggregate, while the presently claimed process requires providing porous, inert base particles.

Instead Skadulis discloses a porous ceramic roofing granule *coating* containing cuprous oxide or cuprous bromide (col. 2, lines 37-55). Skadulis contemplates applying his coating to "any suitable raw mineral granules such as greystone (argillite) or

nepheline syenite (col. 3, lines 43-48). The coatings are formed from insolubilized clay-alkali metal silicate compositions which are heated to above the dehydration point of the silicate but below the melting point of the clay to form insoluble but durable and slightly water-permeable coatings (col. 3, lines 23-29).

The mineral aggregates disclosed by Skadulis are conventional and are not explicitly known to be porous, and there is nothing to suggest any are inherently porous. Further, Skadulis does not bind together mineral aggregate particles to form the base mineral aggregate. Instead, the aggregate has already been sized before Skadulis applies his coating (see Example I). Thus, Skadulis cannot provide inherently porous base material formed from smaller particles.

Reconsideration and withdrawal of the rejection entered under 35 U.S.C. 102(b) over Skadulis as applicable to the amended claims are respectfully requested for this reason.

Nor does Skadulis render the presently claimed invention obvious. There is nothing in Skadulis' disclosure to reveal or suggest applicants' presently claimed invention to one of ordinary skill in the art. Skadulis suggests only the use of conventional aggregate for use as base particles, and a different approach to the problem of extended release of algaecide from the granules, using a water-permeable coating.

Claims 1, 5-8, 16, 17 stand rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 3,507,676 ("McMahon"). This rejection is respectfully but strenuously traversed, and reconsideration and withdrawal of the rejection are respectfully requested as applicable to the amended claims.

The Examiner states that McMahon discloses a process for producing algae resistant roofing granules, the process comprising applying a kaolin (aluminosilicate)

containing coating to greystone or nepheline syenite granules (referencing column 3, lines 44-48) of #11 grade in a tumbling barrel type mixer, pre-drying the granules and transferring them to a rotary firing pot and firing at 950 degrees F (510 degrees C) (referencing column 4, lines 15-34), then applying to the formed base particles an aqueous composition containing zinc oxide followed by firing at 700 degrees F (371 degrees C) to insolubilize the silicate coating (referencing column 4, lines 35-52).

McMahon does not employ porous mineral aggregate either.

Instead, like Joedicke and Skadulis, McMahon discloses roofing granule *coating compositions* containing an algaecide, in this case, metallic zinc, zinc oxide or zinc sulfide (col. 2, lines 7-17). McMahon also contemplates applying his coating to "any suitable raw mineral granules such as greystone (argillite) or nepheline syenite (col. 3, lines 45-50). The coatings are formed from metal silicate compositions that are insolubilized by heat or chemical treatment.

The mineral aggregates disclosed by McMahon are conventional and are not explicitly known to be porous, and there is nothing to suggest any are inherently porous. McMahon similarly does not bind together mineral aggregate particles to form the base mineral aggregate. Again, the aggregate has already been sized before McMahon applies his coating (see Example I). McMahon does not provide inherently porous base material formed from smaller particles.

Reconsideration and withdrawal of the rejection entered under 35 U.S.C. 102(b) over McMahon as applicable to the amended claims are respectfully requested for this reason.

McMahon does not render the presently claimed invention obvious. There is nothing in McMahon's disclosure to provide or suggest applicants' presently claimed invention to one of ordinary skill in the art. McMahon, like Joedicke and Skadulis,

suggests only the use of conventional aggregate for use as base particles, and a different approach to the problem of extended release of algaecide from the granules, using a coating with a zinc algaecide, or scattering metallic zinc particles among conventional roofing granules on the surface of a roofing shingle.

Claims 2-4, 15, and 18 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Joedicke, Skadulis, or McMahon in view of U.S. Patent 4,946,505. ("Jungk"). This rejection is also respectfully traversed. Reconsideration and withdrawal of the rejection as applicable to the amended claims are respectfully requested.

The Examiner states that Joedicke, Skadulis, and McMahon are applied here for the same reasons as in the case of each of the rejections entered under 35 U.S.C. 102(b). The Examiner admits that Joedicke, Skadulis, and McMahon each fail to teach that instead of using #11 grade mineral aggregate, the base particles should be prepared from a mixture including stone dust and a binder (referencing present Claim 2); that the mixture is to be formed into base particles by a forming process selected from press molding, cast molding, injection molding, extrusion, spray granulation, gel casting, pelletizing, compaction and agglomeration (referencing present Claims 4 and 15).

The Examiner states that Jungk teaches that dusty powders can be granulated by means of conventional rotating pelletizing drum or plate before their use (referencing column 3, lines 52-62) so that no dust will be raised as the granules are handled (referencing column 3, lines 13-17).

The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used stone dust in Joedicke or Skadulis or McMahon by first granulating the dusty stone by means of conventional

rotating pelletizing drum or plate and an aqueous solution of a binder before their use no dust will be raised as the granules are handled, as taught by Jungk

The Examiner's conclusion is not correct, and reconsideration and withdrawal of this rejection are respectfully requested. The combination of references cited by the Examiner does not establish a *prima facie* case of obviousness. Even if one of ordinary skill in the art were to follow the combined teachings of the cited references, she would not arrive at the process of the presently claimed invention. Further, there is no suggestion or motivation in any of the cited references nor in any combination of the cited references that would induce one of ordinary skill in the art to combine their teachings in the manner suggested by the Examiner.

Jungk discloses an improved process for dyeing concrete using very small pigment beads. The beads consist of pigment powder particles and a binder. The binder is a dispersant for the pigment powder particles in the concrete.

Jungk teaches the art of pigment granules formed from pigment powders and binders for the purpose of dying concrete and reducing pigment dusting during mixing of such colorant. Jungk's invention is very different from the presently claimed invention.

The pigment granules of Jungk are designed to quickly dissolve in a concrete mix to provide coloring. On the other hand, granules intended for use in manufacturing roofing products require certain specific properties and outdoor durability. Roofing granules require certain minimum level of crushing strength in order to endure the mechanical and chemical processing steps they experience during the granule and shingle manufacturing processes, so that they maintain their physical integrity and shape. Roofing granules must also exhibit exceptional outdoor durability, in excess of 20 years or more. These requirements are well known in the art and are touched upon in the cited roofing granule references cited by the Examiner, namely, Joedicke,

Skadulis and McMahon. Jungk's pigment granules cannot possibly meet these requirements. Jungk also fails to disclose stabilizing his granules after formation, and in fact intends that they dissolve in wet cement, an aqueous mixture.

Thus, Jungk is not properly combinable with the roofing granule art the Examiner cites in respect of her Section 102(b) rejections. One of ordinary skill in the art would not look to Jungk for guidance regarding how to make roofing granules. Jungk's granules are too small to be used as roofing granules (e.g., cf. Example 1, providing pigment beads with a mean particle size of 150 to 250 micrometers). It is important that roofing granules be durable, but Jungk's granules are bound with a surfactant effective to disperse the pigment particles in concrete. They would dissolve the first time it rained on a roof shingled with products "protected" by such granules. Further, the binder Jungk employs is organic and would not survive the elevated temperatures required to cure the silicate coating compositions typically used to coat roofing granules. In the roofing granule art, dust is typically controlled by applying oil and there is thus no need for granulating small particles of stone (cf., e.g. Joedicke, col. 3, lines 15-18). Thus, there is no motivation provided by Jungk to granulate stone dust.

Regarding the rejection as applied to claims 2-4, there is nothing in Jungk that discloses or suggests that Jungk's pigment beads are porous. As noted above, none of Joedicke, Skadulis, and McMahon discloses or suggests use of porous base particles. Thus, there is nothing in the combination of Jungk with any of Joedicke, Skadulis or McMahon that would suggest the production of porous base particles to one of ordinary skill in the art. Claims 2-4 depend from Claim 1, which requires porous base particles. Thus, the combination of references cited by the Examiner does not establish a *prima facie* case of obviousness.

With respect to claims 15 and 17, these claims require the inclusion of at least one inorganic algaecide in the mixture of stone dust and binder. Each of Joedicke, Skadulis and McMahon teach including an algaecide in a coating for the granules, and not in the granules themselves. Thus, if one of ordinary skill in the art were to follow the combined teachings suggested by the Examiner, she would arrive at coated granules having algaecide in the coating but not in the base particle. Such coated granules would not meet the limitations of applicants' present claims 15 and 17.

Reconsideration and withdrawal of the rejection entered under 35 U.S.C. 103(a) over the combination of Joedicke/Skadulis/McMahon in view of Jungk as applicable to the amended claims are respectfully requested for these reasons.

Claims 9-12 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Joedicke or Skadulis in view of Jungk, further in view of U.S. Patent 6,306,795 ("Ryan"). This rejection is also respectfully but strenuously traversed. Reconsideration and withdrawal of the rejection as applicable to the amended claims are respectfully requested.

The Examiner states that Joedicke or Skadulis in view of Jungk is applied here for the same reasons as discussed in connection with the rejection of claims 2-4, 15, and 18. The Examiner admits that Joedicke or Skadulis in view of Jungk fails to teach that inorganic algaecide is provided in the base particles after the base particles are fired, an algaecide-forming compound being dissolved in a fluid to form a solution, the solution being drawn into the pores in the base particles by capillary action to form solution-laden particles, the solution-laden particles being subsequently treated to convert the algaecide-forming compound to an inorganic algaecide (referencing Claim 9). The Examiner also admits that the cited subcombination fails to teach that the algaecide-forming compound be a soluble copper salt (referencing Claim 10).

The Examiner further states that Ryan et al teach that cuprous oxide can be incorporated into a porous carrier material such as silica alumina (citing column 10, lines 27-28) by impregnating the porous carrier material with an aqueous solution of copper salts such as copper nitrate using e.g. well known the pore-volume impregnation (PVI) method (citing column 11, lines 4-7, 22-42, 50-67), air drying and calcining the impregnated porous carrier material at 200 degrees C - 540 degrees C to convert the copper salt to cupric oxide, cuprous oxide, or a mixture of the two (referencing column 12, lines 1-22).

The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have added copper salts such as copper nitrate in an aqueous coating composition of Joedicke or Skadulis in view of Jungk instead of cuprous oxide (claimed slurry) before firing at 700 degrees F (371 degrees C) with the expectation of providing the desired intimate mixture of copper oxides with the porous carrier material, since Ryan teaches that cuprous oxide can be incorporated into a porous carrier material such as silica alumina by impregnating the porous carrier material with an aqueous solution of copper salts such as copper nitrate using, for example, the well-known the pore-volume impregnation (PYI) method, air drying and calcining the impregnated porous carrier material at 200 degrees C-540 degrees C to convert the copper salt to cupric oxide, cuprous oxide, or a mixture of the two.

The Examiner's conclusion is not correct. The combination of references cited by the Examiner does not make out a *prima facie* case of obviousness with respect to applicants' invention as claimed in Claims 9-12.

Ryan is not properly combinable with Joedicke or Skadulis because Ryan relates to a non-analogous art, the preparation of chemical catalysts.

Further, as noted above, the combination of Joedicke or Skadulis in view of Jungk does not provide porous base particles, but rather non-porous pigment particles coated with an exterior coating including an algaecide. The coating of these particles is at least slightly moisture permeable, so that if one of ordinary skill in the art were to carry out the process of Ryan on these hypothetical particles, at least some soluble copper salt may be drawn into the coating. However, there is no reason to believe that the soluble copper salt would be drawn into the core. First, there is no express disclosure in Jungk that his pigment particles are porous. Second, coating these pigment particles with a ceramic layer as taught by Joedicke or Skadulis would likely block any penetration of a copper salt solution into the interior of the granules that might otherwise occur.

Furthermore, there is nothing in any of the individual references cited nor in any combination thereof which suggests or discloses the presently claimed invention to one of ordinary skill in the art. On the contrary, Ryan's disclosure would teach one of ordinary skill in the art away from the use of Ryan's supported copper base catalysts as algaecidal roofing granules.

Ryan discloses that the supported copper base catalysts have superior water reabsorption resistance compared with a conventional prior-art catalyst (Example 7) and superior copper leaching resistance compared with prior art aluminum oxide supported copper based catalyst (Example 8). For roofing granules to exhibit algaecidal properties, at least some water must get into the granules and some algaecide must be leached out from the granules. One of ordinary skill in the art would not expect this to happen if she were to try to use Ryan's leach resistant catalysts.

Furthermore, one of ordinary skill in the art would not combine Jungk and Ryan. Ryan requires a catalyst carrier material, such as conventional calcined aluminum oxide

or other well known catalyst support material. Jungk pigment particles are not porous, and could not possibly function as a catalyst support material.

Further, applicants' presently claimed invention required stone dust to be employed, as claims 9-12 depend through claims 6, 4 and 3 on claim 2. None of the cited references disclose or suggest the use of stone dust, and they cannot make out a *prima facie* case of obviousness for this reason, *inter alia*.

Reconsideration and withdrawal of the rejection entered under 35 U.S.C. 103(a) over the combination of Joedicke/Skadulis/McMahon in view of Jungk and further in view of Ryan as applicable to the amended claims are respectfully requested for these reasons.

Claims 13-14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Skadulis. This rejection is respectfully traversed, and reconsideration and withdrawal of the rejection are respectfully requested as applicable to the amended claims.

The Examiner states that Skadulis is applied in this rejection for the same reasons previously stated. The Examiner also states that Skadulis further teaches that a colored coating in a silicate binder followed by firing has been used to obtain colored granules (referencing column 1, lines 61-72 to column 2, lines 1-5). The Examiner admits that, Skadulis does not expressly show that the algaecidal coating is further coated with a colored coating to obtain colored granules.

The Examiner concludes that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have coated the algaecidal coating in Skadulis with a colored coating in a silicate binder followed by firing, since Skadulis further teaches that a colored coating in a silicate binder followed by firing has been used to obtain colored granules.

The Examiner's citation of Skadulis does not establish a *prima facie* case of obviousness with respect to Claims 13 and 14.

Claim 13 depends from Claim 1, which requires porous base particles. Skadulis does not disclose or suggest porous base particles. Thus, coating Skadulis' non-porous base particles with an algacidal coating followed by a color coating would not provide process for producing algae-resistant roofing granules disclosed in Claims 13 and 14.

Thus, there is nothing which discloses or would suggest the presently claimed process to one of ordinary skill in the art. Reconsideration and withdrawal of the rejection entered under 35 U.S.C. 103(a) of claims 13 and 14 over Skadulis are respectfully requested for these reasons.

Applicants respectfully solicit reconsideration, withdrawal of the rejections entered, and an early notice of allowance.

Respectfully submitted,



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November 10, 2005

Order No. 3570